

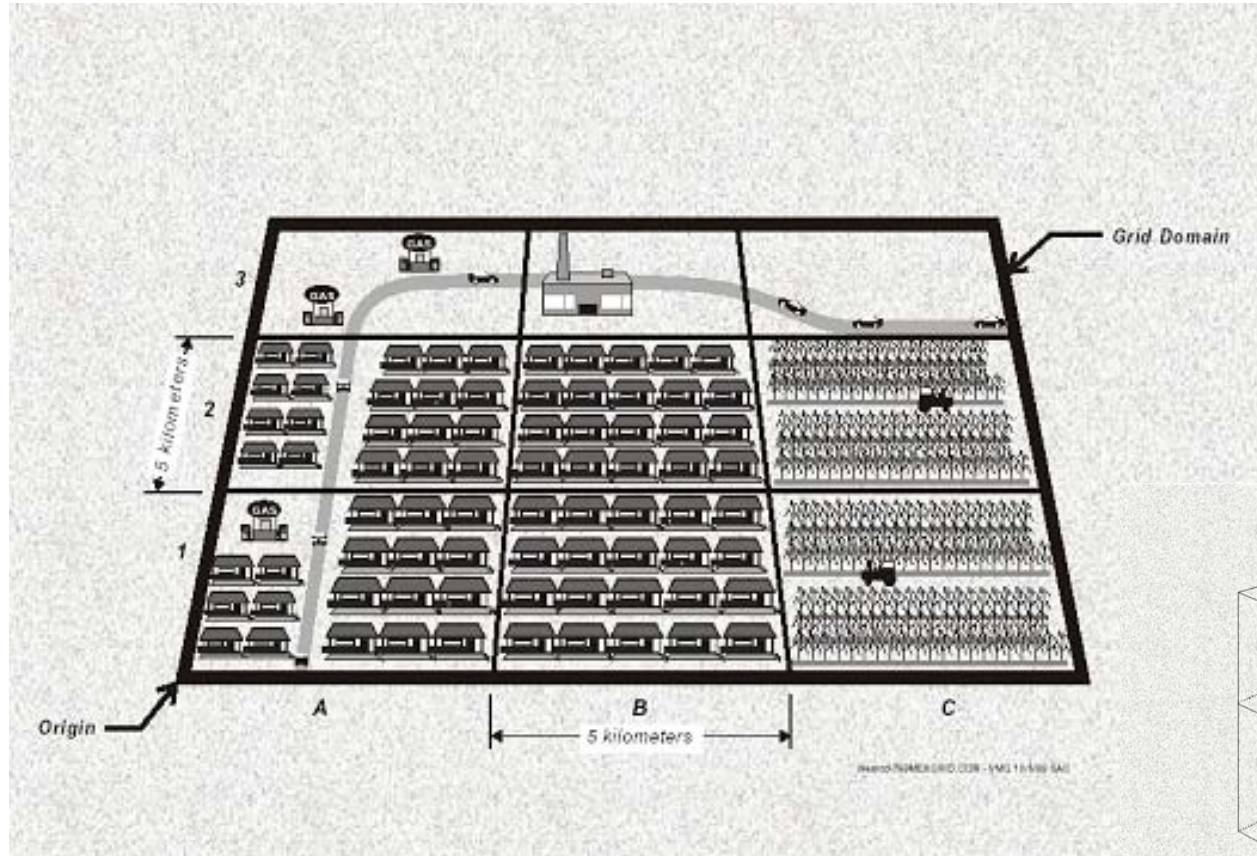
**Use of Photochemical Models to  
Determine Ozone Removal and  
Ozone Generation  
Associated with Agricultural Crops**

October 31, 2002

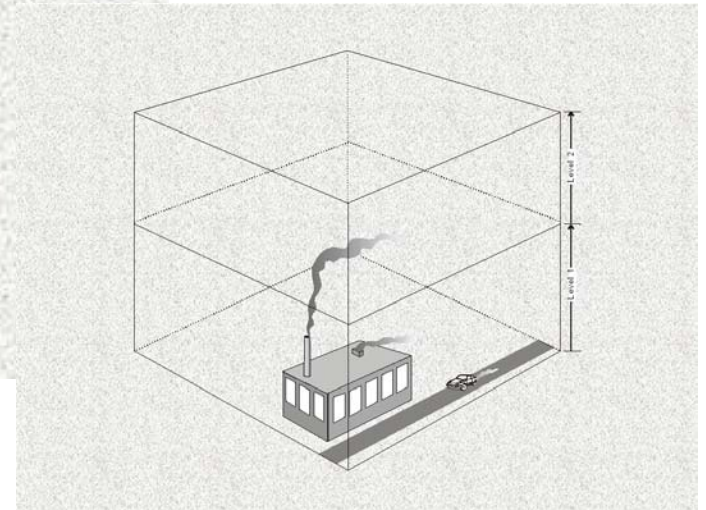
# Overview

- **Preparing Model Inputs**
  - Emissions
  - Meteorology
  - Observed Data
- **Performing Air Quality Modeling**
- **Assessing Ozone Uptake and Generation Due to Agricultural Crops**

# Preparing Inputs – Emissions



- Stationary
- Area-wide
- On-Road Mobile
- Off-Road Mobile
- Biogenic



# Emissions Chemistry

## - Speciation -

- Emissions are Estimated for:  
CO, NO<sub>x</sub>, SO<sub>x</sub>, TOG, and PM
- Photochemical Models Need Gridded,  
Hourly Emission Estimates for *Model  
Species*

# **Processing Steps**

- **Calculate Emission Estimate (EF x Activity)**
- **Spatially Allocate Emissions (Grid-Cell)**
- **Temporally Allocate Emissions (Hourly)**
- **Group Emissions of Discrete Chemicals by Reactivity ('Lumped' Specie)**
- **Format Data for use in Air Quality Model**

# **Agricultural Crop Emissions**

- **Calculated Using ARB's BEIGIS Model**
  - Estimates Hourly Emissions within each Grid Cell
- **Spatial Allocation**
  - Map of Crops, Plant Species, and Land Use (DWR)  
Overlaid on Modeling System Grid
- **Emission Factors**
  - Plant Species Emission Rates (Standard Conditions)
  - Adjusted for Temperature & Solar Intensity (Met Model)
  - Adjusted for Mass Based on Leaf Area Index (LAI) Data

# Crop Emissions (cont.)

- **Temporal Allocation**
  - Hourly Meteorological Model Estimates of T and Solar Intensity for each Grid Cell are Utilized
- **Speciation**
  - BEIGIS Produces Gridded, Hourly Emission Estimates for Isoprene, Monoterpene, and Methylbutenol

# **Other Emission Sources**

- **Natural Area Biogenic Emissions**
- **Countywide Emission Estimates**
  - Stationary Sources (CEIDARS)
  - On-Road Mobile Sources (EMFAC)
  - Off-Road Mobile Sources (OFFROAD)
- **Day-Specific Emission Events (Field Data)**